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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/594,040

09/25/2006

Hideyuki Wada

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EXAMINER

MUNOZ, ANDRES F

ART UNIT

PAPER NUMBER

2894

NOTIFICATION DATE

DELIVERY MODE

01/29/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/594,040	Applicant(s) WADA ET AL.	
	Examiner Andres Munoz	Art Unit 2894	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action (OA) is in response to Applicant's Amendment filed on 10/16/2009. Claims 1-8, 10-17 are pending. Objections to drawings/claims set forth in previous OA (08/07/2009) are withdrawn.

Claim Objections

2. **Claim 7** is objected to because of the following informalities: "and which is formed on at first surface" is unclear. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1-6, and 14-17** are rejected under 35 U.S.C. 102(b) as being anticipated by Hanaoka et al. (hereinafter "Hanaoka", US PGPub 2002/0030245 A1).

Regarding claim 1, Hanaoka discloses a through wiring board provided with a through wiring in a through hole which is formed through a board, said through wiring board comprising: the through hole (4) opened through said board (6); a through extension wiring (8) with which said through hole is filled (partially, see response to arguments) and which is formed on one surface of said through wiring board (outside of hole 4 and towards element 20) to extend (as wire 18) to a position at a predetermined

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distance (towards element 20) from said through hole; and a bump (24) having a conductivity, formed on said through extension wiring and located in a position (around element 20 as wire 18) other than the position where said through hole is opened (Fig. 1, [0122-0123]).

Regarding claim 2, Hanaoka discloses an insulating layer (10) is provided between said board (6) and at least said through wiring (8) and said through extension wiring (18) (Figs. 1 & 7B, [0122-0123], [0149]).

Regarding claim 3, Hanaoka discloses a through extension wiring (8) with which said through hole is filled in the other surface (opposite to surface where bump of claim 1 is disposed) of said through wiring board and which is formed on the other surface of said through wiring board to extend (towards bump 80) to a position at a predetermined distance from said through hole; and a bump (80) having a conductivity, formed on said through extension wiring and located in a position other than the position where said through hole is opened (Fig. 13, [0200]. The examiner interprets the “other surface of...through wiring board” as that one opposite to the surface where first bump is formed.)

Regarding claim 4, Hanaoka discloses a through wiring board provided with a through wiring in a through hole which is formed through a board, said through wiring board comprising the through hole (4) opened through said board (6); an insulating resin layer (40) formed on the surface of said through wiring board (outside of hole 4 and towards element 20) except for the area where said through hole is opened in at least one surface of said through wiring board; a through extension wiring (8) with which

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said through hole is filled (partially, see response to arguments) and which is formed on said insulating resin layer on said one surface of said through wiring board to extend to a position at a predetermined distance (towards element 20) from said through hole; and a bump (24) having a conductivity, formed on said through extension wiring and located in a position other than the position where said through hole is opened (Figs. 1, 7A, [0122-0123], [0144]).

Regarding claim 5, Hanaoka discloses a method of manufacturing a through wiring board provided with a through wiring in a through hole which is formed through a board, said method comprising: a step of forming the through hole (4) opened through said board (6); a step of forming a through extension wiring (8) on one surface of said through wiring board to fill (partially, see response to arguments) said through hole and extend to a position at a predetermined distance (towards element 20) from said through hole, and a step of forming a bump (24) having a conductivity on said through extension wiring in a position other than the position where said through hole is opened (Figs. 1, 7A, 9C & 10C, [0122-0123], [0147], [0158], [0173]).

Regarding claim 6, Hanaoka discloses a method of manufacturing a through wiring board provided with a through wiring in a through hole which is formed through a board, said method comprising a step of forming the through hole (4) opened through said board (6); a step of forming an insulating resin layer (40) on the surface of said through wiring board (outside of hole 4 and towards element 20) except for the area where said through hole is opened in at least one surface of said through wiring board; a step of forming a through extension wiring (8) on one surface of said insulating resin

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layer to fill (partially, see response to arguments) said through hole and extend to a position at a predetermined distance (towards element 20) from said through hole; and a step of forming a bump (24) having a conductivity on said through extension wiring in a position other than the position where said through hole is opened (Figs. 1, 7A, 9C & 10C, [0122-0123], [0144], [0147], [0158], [0173]).

Regarding claim 14, Hanaoka discloses a seed layer (78, “catalyst”) disposed between the insulating layer (10) and the through extension wiring (8, Fig. 9C, [0158]).

Regarding claim 15, Hanaoka discloses an insulating layer (10) is provided between said board (6) and at least said through wiring (8) and said through extension wiring (outside of hole 4 and towards element 20, Fig. 10C); and further comprising a seed layer (78, “catalyst”) disposed between the insulating layer (10) and the through extension wiring (and said through wiring, Fig. 9C, [0158]).

Regarding claims 16 and 17, Hanaoka discloses forming an insulating layer (10) provided between said board (6) and at least said through wiring (8) and said through extension wiring (outside of hole 4 and towards element 20, Fig. 10C); and forming a seed layer (78, “catalyst”) disposed between the insulating layer (10) and the through extension wiring (Fig. 9C, [0158]).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 7, 8, 10-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanaoka in view of Wood et al. (hereinafter "Wood", US PGPub 2004/0207081 A1).

Regarding claim 7, Hanaoka discloses a through wiring board provided with a through wiring in a through hole which is formed through a board, said through wiring board comprising: the through hole (4) opened through said board (6); a through wiring (8) formed in said through hole; a first reroute wiring (18) which is formed on at first surface (for example, bottom) of said through wiring board (6) to extend on said first surface of said through wiring board to a position at a predetermined distance (towards element 20); a bump (24) having a conductivity, formed on said first reroute wiring and located in a position other than the position (around element 20 as wire 18) where said first reroute wiring of said through wiring is formed (Fig. 13, [0122-0123], [0198-0201]); a second reroute wiring (18) on a second surface (where bump 80 is disposed) of said through wiring board (6) and which is formed on the second surface of said through wiring board to extend (towards bump 80) to a position at a predetermined distance; and a bump (80) having a conductivity, formed on said second reroute wiring and located in a position (Fig. 13, [0122-0123], [0198-0201]).

Hanaoka does not disclose:

- A: a first reroute wiring "which comes in contact with a first exposed wiring portion of said through wiring", and a "predetermined distance from said first exposed wiring portion".

- B: a second reroute wiring “which comes in contact with a second exposed wiring portion of said through wiring”, a “predetermined distance from said second exposed wiring portion”, and a bump located in a position “other than the position where said second exposed wiring portion of said through wiring is formed”.

Wood discloses: a reroute wiring (42B) which comes in contact with an exposed wiring portion of said through wiring (38B) (Figs. 2E & 3B, [0055], [0070]).

Wood discloses the use of a reroute wiring that comes into contact with an exposed wiring portion of a trough wiring formed in a through hole and that extends, said reroute wiring, in a direction from the through hole and from said exposed region, and where a bump is formed in such direction extending from the through hole.

Hanaoka discloses a first and second reroute wiring on a first and second surface of a through wiring board, one of ordinary skill in the art would find obvious to apply the disclosure of Wood to both the first and second reroute wiring of Hanaoka so as to have the limitations as claimed (see above, items “A” and “B”) in order to apply the advantages of Wood to both surfaces of Hanaoka, namely, to re-distribute electrical connections and provide alternatives for testing and selectively address active circuitry as taught by Wood, [0055], [0070]).

Finally, at the time of the invention, it would have been obvious to modify the reroute wiring of Hanaoka with the reroute wiring as taught by Wood, so as to, as state above, re-distribute electrical connections and provide alternatives for testing and selectively address active circuitry (Wood – [0055], [0070]).

Regarding claim 8, Hanaoka discloses an insulating layer (10) is provided between said board (6) and at least said through wiring (8) and both of said first reroute wiring (18, on bottom) and said second reroute wiring (18, on top also noted as 14) (Figs. 1, 7B & 13, [0122-0123], [0126], [0149], [0200]).

Regarding claim 10, Hanaoka discloses a through wiring board provided with a through wiring in a through hole which is formed through a board, said through wiring board comprising: the through hole (4) opened through said board (6); a through wiring (8) formed in said through hole; an insulating resin layer (40) formed on the surface of said through wiring board (outside of hole 4 and towards element 20) except for the area where a first exposed wiring portion (of through wiring 8) is located on a first surface (for example, bottom) of said through wiring board (6); a first reroute wiring (18) which is formed on said insulating resin layer (40) on a first surface of said through wiring board to extend to a position at a predetermined distance (towards element 20); a bump (24) having a conductivity, formed on said first reroute wiring and located in a position (Figs. 13, [0122-0123], [0144], [0198-0201]); a second reroute wiring (18) on a second surface (where bump 80 is disposed) of said through wiring board (6) and which is formed on the second surface of said through wiring board to extend (towards bump 80) to a position at a predetermined distance; and a bump (80) having a conductivity, formed on said second reroute wiring and located in a position (Fig. 13, [0122-0123], [0198-0201]).

Hanaoka does not disclose:

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- A: a first reroute wiring “which comes in contact with said first exposed wiring portion of said through wiring”, a “predetermined distance from said first exposed wiring portion”, and a bump located in a “position other than the position where said first exposed wiring portion is formed”.

- B: a second reroute wiring “which comes in contact with a second exposed wiring portion of said through wiring”, a “predetermined distance from said second exposed wiring portion”, and a bump located in a position “other than the position where said second exposed wiring portion of said through wiring is formed”.

Wood discloses: a reroute wiring (42B) which comes in contact with an exposed wiring portion of said through wiring (38B) (Figs. 2E & 3B, [0055], [0070]).

Wood discloses the use of a reroute wiring that comes into contact with an exposed wiring portion of a trough wiring formed in a through hole and that extends, said reroute wiring, in a direction from the through hole, for said exposed region, and where a bump is formed in such direction extending from the through hole.

Hanaoka discloses a first and second reroute wiring on a first and second surface of a through wiring board, one of ordinary skill in the art would find obvious to apply the disclosure of Wood to both the first and second reroute wiring of Hanaoka so as to have the limitations as claimed (see above, items “A” and “B”) in order to apply the advantages of Wood to both surfaces of Hanaoka, namely, to re-distribute electrical connections and provide alternatives for testing and selectively address active circuitry as taught by Wood, [0055], [0070]).

Finally, at the time of the invention, it would have been obvious to modify the reroute wiring of Hanaoka with the reroute wiring as taught by Wood, so as to, as state above, re-distribute electrical connections and provide alternatives for testing and selectively address active circuitry (Wood – [0055], [0070]).

Regarding claim 11, Hanaoka discloses there is a protrusion (20) made of an insulating resin (70, [0157]) on said insulating resin layer (40) formed on said first surface of said through wiring board except for the area where said first exposed wiring portion is located, wherein said first reroute wiring is formed in order to cover (depicted as element 14) said protrusion, and wherein the bump (24) having the conductivity is formed on said first reroute wiring which is formed on the upper surface of said protrusion (Figs. 1, 7A & 10C, [0122-0123], [0144], [0173]).

Regarding claim 12, Hanaoka discloses a method of manufacturing a through wiring board provided with a through wiring in a through hole which is formed through a board, said method comprising a step of forming a through wiring (8) in the through hole (4) opened through said board (6); a step of forming a first reroute wiring (18) on a first surface of said through wiring board in order to extend to a position at a predetermined distance (towards element 20); a step of forming a first bump (24) having a conductivity on said through extension wiring in a position other than the position where said through hole is opened (Figs. 1, 7A, 9C, 10C & 13, [0122-0123], [0147], [0158], [0173], [0198-0201]); a step of forming a second reroute wiring (18) in a second surface (where bump 80 is disposed) of said through wiring board (6) in order extend to a position at a predetermined distance (toward bump 80); and a step of forming a second bump (80)

having a conductivity on said through extension wiring (18) in a position other than the position where said through hole is opened (Fig. 13, [0122-0123], [0198-0201]).

Hanaoka does not disclose:

- A: a first reroute wiring to “come in contact with a first exposed wiring portion of said through wiring”, and a “predetermined distance from said first exposed wiring portion”.
- B: a second reroute wiring to “come in contact with a second exposed wiring portion of said through wiring”, and a “predetermined distance from said second exposed wiring portion”.

Wood discloses: a reroute wiring (42B) which comes in contact with an exposed wiring portion of said through wiring (38B) (Figs. 2E & 3B, [0055], [0070]).

Wood discloses the use of a reroute wiring that comes into contact with an exposed wiring portion of a trough wiring formed in a through hole and that extends, said reroute wiring, in a direction from the through hole, for said exposed region, and where a bump is formed in such direction extending from the through hole.

Hanaoka discloses a first and second reroute wiring on a first and second surface of a through wiring board, one of ordinary skill in the art would find obvious to apply the disclosure of Wood to both the first and second reroute wiring of Hanaoka so as to have the limitations as claimed (see above, items “A” and “B”) in order to apply the advantages of Wood to both surfaces of Hanaoka, namely, to re-distribute electrical connections and provide alternatives for testing and selectively address active circuitry as taught by Wood, [0055], [0070]).

Finally, at the time of the invention, it would have been obvious to modify the reroute wiring of Hanaoka with the reroute wiring as taught by Wood, so as to, as state above, re-distribute electrical connections and provide alternatives for testing and selectively address active circuitry (Wood – [0055], [0070]).

Regarding claim 13, Hanaoka discloses a method of manufacturing a through wiring board provided with a through wiring in a through hole which is formed through a board, said method comprising a step of forming a through wiring (8) in the through hole (4) opened through said board (6); a step of forming an insulating resin layer (40) on a first surface of said through wiring board (outside of hole 4 and towards element 20) except for the area a first exposed wiring portion (of through wiring 8) is located on said first surface of said through wiring board; a step of forming a first reroute wiring (18) on said first surface of said through wiring board in order to extend on said insulating resin layer to a position at a predetermined distance (towards element 20); a step of forming a first bump (24) having a conductivity on said through extension wiring in a position other than the position where said through hole is opened (Figs. 1, 7A, 9C, 10C & 13, [0122-0123], [0144], [0147], [0158], [0173], [0198-0201]); a step of forming a second reroute wiring (18) in a second surface (where bump 80 is disposed) of said through wiring board (6) in order extend to a position at a predetermined distance (toward bump 80); and a step of forming a second bump (80) having a conductivity on said through extension wiring (18) in a position other than the position where said through hole is opened (Fig. 13, [0122-0123], [0198-0201]).

Hanaoka does not disclose:

- A: a first reroute wiring to “come in contact with a first exposed wiring portion of said through wiring”, and a “predetermined distance from said first exposed wiring portion”.
- B: a second reroute wiring to “come in contact with a second exposed wiring portion of said through wiring”, and a “predetermined distance from said second exposed wiring portion”.

Wood discloses: a reroute wiring (42B) which comes in contact with an exposed wiring portion of said through wiring (38B) (Figs. 2E & 3B, [0055], [0070]).

Wood discloses the use of a reroute wiring that comes into contact with an exposed wiring portion of a trough wiring formed in a through hole and that extends, said reroute wiring, in a direction from the through hole, for said exposed region, and where a bump is formed in such direction extending from the through hole.

Hanaoka discloses a first and second reroute wiring on a first and second surface of a through wiring board, one of ordinary skill in the art would find obvious to apply the disclosure of Wood to both the first and second reroute wiring of Hanaoka so as to have the limitations as claimed (see above, items “A” and “B”) in order to apply the advantages of Wood to both surfaces of Hanaoka, namely, to re-distribute electrical connections and provide alternatives for testing and selectively address active circuitry as taught by Wood, [0055], [0070]).

Finally, at the time of the invention, it would have been obvious to modify the reroute wiring of Hanaoka with the reroute wiring as taught by Wood, so as to, as state

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above, re-distribute electrical connections and provide alternatives for testing and selectively address active circuitry (Wood – [0055], [0070]).

Response to Arguments

7. Applicant's arguments filed 10/16/2009 have been fully considered but they are not persuasive. More specifically:

The applicant contends (pp. 11-12, re Hanaoka) that “The Examiner alleges that the conductive layer 8 in Hanaoka corresponds to the through extension wiring recited in claim 1. However, the conductive layer 8 cannot disclose each of the features of the through extension wiring, since the conductive layer does not fill the hole”. However, the conductive layer 8 of Hanaoka is placed/formed inside a hole 4 so as to at least partially fill the hole. Furthermore, the claimed limitation does not recite to what degree/level the hole is filled, and therefore does not preclude a partially filled hole from meeting the limitations as claimed. For the reasons stated above, Hanaoka meets the limitations as claimed.

8. The applicant contends (pp. 12-13, re Hanaoka and Wood) that “Hanaoka fails to disclose that the reroute wiring comes into contact with an exposed wiring portion of said through wiring. However, the Examiner, alleges that Wood cures this deficiency and that the resulting combination would render claim 1 obvious. See the rejection of claim 9 on page 7 of the Office Action. Wood discloses that a connection to contacts 50 and 52 may be connected to one end of conductive member 38. However, Wood fails to disclose that reroute wirings are connected to two exposed wiring portions of a through

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wiring. Rather, Wood is limited to connection to a single exposed wiring. Therefore, Wood cannot cure the deficiency noted with respect to Hanaoka regarding claim 7, and the combination cannot render claim 7 obvious". However, it should be noted that Hanaoka discloses (for example, Figs. 13 & 14) reroute wirings and bumps having a conductivity on opposite surfaces of board 6, so that the disclosure of Wood (i.e., "connection to a single exposed wiring" as acknowledged by the applicant) can be applied to **both** surfaces of Hanaoka, and it is within the combination of Hanaoka and Wood that the claimed limitations are met. Moreover, one cannot show nonobviousness by attacking references individually (in this case, a "connection to a single exposed wiring" of Wood) where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andres Munoz whose telephone number is (571) 270-3346. The examiner can normally be reached on 7:30am - 4:00pm (Mon-Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Nguyen can be reached on (571) 272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andres Munoz/
Examiner, Art Unit 2894
January 22, 2010

/Kimberly D Nguyen/
Supervisory Patent Examiner, Art
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